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CATHERINE FULNACE

Report
on
The Technical Examination
of
The Lands of the Allegheny Ore and Iron Co.,
Roehingham and Page Counties, Va.
Massanutten Area,
by
E. D. Clark, Forest Assistant,
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GENERAL INFORMATION.

Location and Tract.

About 60% of the lands of the Allegheny Ore and Iron Company, are located in Page, and 40% in Rockingham County, Virginia. The northern boundary of this tract is the county line between Page County and Rockingham and Shenandoah Counties, which is locally known as the "old Fairfax line", run by George Washington.

The area of the property is approximately 17,000 acres.
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This tract forms a divide between the North and South Forks of the Shenandoah River. The portion in Page County drains into the South Fork of the Shenandoah River, while the land in Rockingham County drains into Smith's Creek, a tributary of the North Fork of the Shenandoah River.

The nearest town is Shenandoah, Page Co., Virginia, situated on the N. & W. R. R. about three miles east of the tract. New Mar-

ket, in the North Fork Valley, is about four miles northwest of the property, and about two miles east of the Southern R. R.

Ownership;-

The Allegheny Ore and Iron Company, owners of this property, has its office at Iron Gate, Virginia. The office of Mr. Spackman, president of the company, is at Coatesville, Pa. Mr. Hubert C. Bickers, agent for the company, lives at Shenandoah, Va. The present owners acquired the property July 3, 1902 from the Empire Steel and Iron Com-

The original deed called for about 25,000 acres, but parties represented by Gen. Roller, claimed all lands south of Runkle's and Fridley's Cops. In order to settle the dispute, and to obtain a clear title, the land in question was conceded to Gen. Roller and his clients. The property offered to the Government is free from conflicting claims, and no land is held by squatters. The local reputation of the title is unusually good. There are no mineral rights out-standing. A timber right for cutting about 15,000 feet in Morgan's Run, expires in the fall of 1912. This is the only out-standing claim against the property.

The exploitation of this tract began many years before the War. The stands of aged second growth timber, and the old coal hearths, together with mounds of earth and caved-in tunnels, are the remaining evidences of a former iron industry. With its own ore, charcoal and limestone, the region was independent of outside influences. The old stone stack at the confluence of Cub, and Roaring Runs, is the only remains of Catherine Furnace which was operated until about twenty years ago. At this furnace from 1861-1865, cannon balls and other munitions of war were manufactured for the Southern Army.

Although the present owners have not carried on any timber operations, themselves, there has been hardly a month, contractors were not

engaged in getting out whatever merchantable products could be found; lumber, staves, ties and bark have been cut, until now there is not more than 60,000 Bd.Ft. of merchantable timber remaining.

The present stand of timber is so scattered that sufficient timber for a portable mill operation cannot be found in one place. The tract has not been protected, and has been burned over repeatedly. Only in the coves and on the lower slopes has the poisture been sufficient to afford any adequate protection to the second growth. On the ridges and upper slopes, fires have prevented satisfactory re-stocking.

The title to this tract is warranty in character, covering the entire acreage .

Conditions of Proposal;-

The company reserves the mineral rights, and requests the privilege of purchasing mine timbers, if mining operations are resumed.

A price of \$6.00 per acre was originally asked, but the Company has given an option for 6 months , from May 7, 1912, to \$1.25 per acre.

Description of Locality.

Topography and Soil;-

The topography of the tract is for the most part regular, consisting of three main ridges running approximately North and South,, occasional intermediate shorter ridges.

The names of these ridges, beginning at the east, are:-

First Mountain, Middle Mountain, and Massanutten, or Third Mountain. The county line between Page and Rockingham, follows the crest of the last named, which is the farthest west, and at the north end of the tract it corners with the Shenandoah Co. line.

The elevations range from about 1200 feet to 3,000 feet above sea level. The crests of Middle and Massanutten Mountains attain the

greatest elevation. The ridge tops are narrow and often extremely rocky; the slopes are generally rough and rocky, and are separated by long narrow valleys which parallel the mountains.

There are two general rock formations- sandstone and shale. The sandstone, which is hard and flinty, occurs chiefly on the ridges and on the upper slopes. Frequent outcrops and scarps are found. The shale is confined to the lower slopes and coves. Only limited amounts of limestone are found at the higher elevations; the soil is generally thin and unfertile, and is chiefly sandy with a small clay content. In the narrow valleys, however, the soil is usually fairly productive, and consists largely of clay, derived from the shale, mixed with some sand. The soil types blend with each other, and it is difficult to draw lines of demarcation between them.

Cub Run, with its tributaries, Pitts' Spring Run, Roaring Run and Morgan's Run drain all the north and central part of the tract. This stream empties into the South Fork of the Shenandoah near Catherine Furnace. Fridley Run flows from the south-western portion of the tract, west, into the North Fork of the Shenandoah. Boone's Run and Petefish Run, rise in the south-eastern part of the tract, and empty into the South Fork of the Shenandoah.

On about two thirds of the area, the surface is rough, rocky and steep. The slopes and ridges, many of which are precipitous, are covered with rock fragments of all sizes. Over much of the tract logging is difficult, and on a few restricted areas, it is practically impossible.

Inasmuch as the ridges in this tract run north and south, the exposures are all eastern and western, with the exception of north and south exposures in the gaps, where such streams as Pitts' Spring Run,

Morgan's Run, and a few other smaller streams break through the ridges.

Foreforest

The original forest consisted chiefly of a more or less even aged stand of mixed hardwoods; considerable stands of short-leaf pines once covered large areas on the upper south and west slopes. In the coves, white-oak, chestnut, and yellow poplar predominated, while on the slopes and ridges, the chestnut-oak was the most important species, occurring in nearly pure stands of considerable areas.

At present the forest consists, for the most part, of second growth: There is practically no mature timber left, except a very few culled patches of 5 or 10 acres, or less, where for one reason or another, a clear cutting was not made. This timber has at present little commercial value, and serves only to show the character of the original forest. Mature trees, which are either defective or of inferior species, are scattered widely over the entire tract.

The best stands of second growth are found in the coves and on the lower slopes. The ridges are often bare of tree growth.

Elevation has very little direct influence on the forest. Its influence is indirect, rather than direct. As the altitude increases, the slopes become steeper, and the soil moisture is so reduced that on slopes with southern exposures, the moisture-loving hardwoods tend to give way to yellow pine. Because of the keen demand for chestnut oak bark, this product has been almost entirely removed from the tract. It has even proved profitable to cut trees for bark, which had a breast height diameter of only 5 or 6 inches. Some of the better chestnut-oak timber has been utilized for lumber and ties, but much of it has

been left to decay.

Yellow poplar ranks next in importance. The best of this species was taken out some years ago, leaving a few large, defective trees, here and there, throughout the coves, which have aided in re-stocking them.

White Oak ranks third. It has been heavily culled for ties, staves and lumber.

The remaining species are the following in order of importance. Scarlet Oak, Short-leaf Pine, White Pine, Black Gum, Scrub Pine, Red Oak, Hickory, White Ash, Red Maple, Sycamore, Black Birch, Butternut and Hemlock.

The removal of the timber and the repeated burnings have materially affected the stream flow. Farmers living near the tract say that during the wet seasons the streams are much higher, and floods are more numerous than they were fifteen to twenty years ago, when the mountain supported a fair stand of timber. Logging roads through the gaps, have been washed so badly by floods, that they are well nigh impassible. In the dry seasons of summer and early fall, springs and wells of the vicinity, which never failed before the timber was removed, now go dry.

Owing to the exposed conditions of the ridges and upper slopes, and to the unregulated run-off, during and after heavy rains, it is inevitable that the thin sandy soil should erode badly. Although the streams head up in small gullies, the slopes do not now appear to gully. The loose material is carried away by the sheet erosion. Small sand bars are found in the stream beds, and patches of fine water-laid sand are frequent on flats on the mountain slopes.

Through overcutting, slopes and ridges have been left bare, and and no attempt has been made to dispose of the brush. Fires have inevitably followed the cutting, and have swept over the slopes and ridges, killing most of the young growth. Bare rock and thin soil have as a consequence, been left exposed.

Development of Country.

There are four natural outlets from this tract;- Runkle's, Fridley's, Petefish and Cub, Gaps.

Hauling roads, now in poor condition, traverse all the larger streams, and practically, all of the minor tributaries, usually for their entire length. The grades are light, in most cases averaging from three to four per cent. Prohibitive grades along the main streams are rare, but small branches of the roads are in bad condition from washouts, and the grades are often very heavy. The best road trail

At a point between First and Second Mountains, and west of Petefish Gap, is found the terminus of a cable road, built to haul bark. This road runs in a westerly direction, straight over Second and Middle Mountains, and through Fridley Gap. It is now abandoned, and most of the rails have been stolen.

There are very few places that it would be impossible to log on account of topographical difficulties. The most pronounced exception is in the upper basin of Koontz' Run, which is rock-bound. Owing to the scarcity of timber, further logging for the present is quite out of the question. There are sufficient means of transportation, to make logging possible, if the timber were available.

Agricultural Possibilities.

In no case is the soil of sufficient richness and depth, or

the surface level enough, to permit cultivation.

There is supposed to be iron ore in varying quantities on this property, but it is generally understood that the different companies that have undertaken to work the mines, have not been successful financially. Means of transportation are easily available. At one time, a standard gauge road bed was built, and a portion of the track laid, but never completed. This line extended from the N. & W. R. R. at Grove Hill to Catherine Furnace, and was used from Grove Hill to the River.

Although a few head of stock are grazed on the tract every summer, the range, even in the valleys, is so poor that they do not thrive.

Owing to its accessibility and wildness, the Massanutten, if protected, should become a popular recreational area. There are many spots along Cub and Pitts' Spring Runs that would afford excellent camping sites.

With proper protection, these Mountains could be kept successfully stocked with fish and game.

At the Confluence.

A storage reservoir could be constructed of Cub and Roaring runs, that could supply water for Shenandoah and Stanley. Although such a reservoir would supply water for town use, it would scarcely be capable of supplying steady power for commercial use.

Description of Tract.

Forest Types.

In the cone type, the principal species are;- yellow poplar, scarlet oak, black oak, white oak and red oak, chestnut, hickory and locust. This type, which occupies about 8% of the total area of the tract, is found only along stream bottoms and, ordinarily varies in

width from 2 to 10 chains,- in rare instances it reaches a width of 25 chains. Its altitudinal range is approximately from 1200 to 1500 feet above sea level. Inasmuch as the streams run approximately North and South, this type has eastern and western aspects. About 60% of this type is re-stocked with a fast stand of second growth timber, consisting chiefly of scarlet oak, red oak, white oak, yellow poplar, locust and chestnut oak.

In the slope type the principal species are, in order of importance; chestnut oak, chestnut, red and black oak, yellow pine, and white oak. The total area of this type represents 77% of the entire tract. The altitudinal range is approximately, from 1500 to 2000 feet above sea level. The slope type has for the most part, an eastern and western aspect, both of which have heavy grades. The slope type has all been heavily cut over and burned, more or less. The west slopes are in markedly poor condition, while the east slopes are re-stocking fairly well. Scarlet oak, chestnut and yellow pine have made repeated attempts to reproduce, and where fire has not been too severe, they have, in a fair measure restocked this type. At present, yellow pine shows up best, and in many places, has a good start. Most of the yellow pine was killed twenty years ago by bark beetles.

In the ridge type the principal species, in order of importance, are :- chestnut oak, yellow pine, and chestnut. This type is found usually in a strip from 10 to 15 chains wide, along the tops of ridges and major divides. Occasionally it has the width of 30 chains. Its altitudinal range is from 2000 feet to 3300 feet, which is the highest elevation found on the tract. Chestnut oak, locust and yellow pine have reproduced most successfully, but these species form ^a sparse stand of short stunted trees, owing to the poor soil, and to repeated fires.

The original yellow pine on this type, as upon the slopetype has suffered from bark borers.

Valuation of Timber.

The present absence of merchantable timber is proof of the past demand. What timber was not used in the wide agricultural valleys along the two forks of the Shenandoah River, was either shipped to northern markets, or left to decay after the bark had been removed. Tanneries at Elkton, Harrisonburg and Luray, furnished a never-failing market for bark.

These Mountains, which adjoin broad agricultural valleys, should produce timber to their utmost capacity to supply the increasing demand for lumber, posts and fuel.

The current stumpage prices are \$3.00 per M. for all kinds of lumber. Owing to the lack of merchantable timber, a further discussion of stumpage prices is not necessary.

It is of interest to note that a part of the tract contains young timber which in 25 years will be of value. In order to get a rough estimate of the second growth timber in the coves and on the lower slopes, one-quarter acre sample plots were taken. A closer estimate was not made because there is no present market for cord-wood. About 1,000 acres contain young timber which is not now merchantable, but which in a few years, may be cut at a profit.

The present volume in cubic feet, is shown by species for lower slope and cove conditions in the following table:--

TABLE # 1.

Stand per Acre of Second Growth Timber by Species.

S SPECIES.	No. of Trees	Aver. D.B.H.	Vol. Cu.ft.	Percentage of Total. In Nos. --	Total. In Vol.
White Oak	33	5.6"	132	17.6	15.9
Scarlet Oak	71	5.8"	312.4	37.8	37.7
Black Oak	5	4.6"	14.0	2.0	1.7
Chestnut Oak	35	3.5"	140.0	18.0	16.9
Chestnut	5	5.2"	18.0	2.6	2.3
Locust	8	6.7"	48.8	4.3	5.9
Red Maple	4	5.5"	16.0	2.0	1.9
Yellow Poplar	5	9.0"	59.0	2.0	7.2
Ash	7	6.0"	33.0	3.7	4.0
Hickory	7	3.4"	10.5	3.7	1.3
Yellow pine	7	6.5"	39.9	3.7	4.6
Black Gum	<u>1</u>	5.0"	<u>3.2</u>	<u>.6</u>	<u>.4</u>
TOTAL	188		827.4	100.0	100.0

The above table shows the results obtained from four one-quarter acre sample plots, or a total of one acre.

Allowing 80 cubic feet to the solid cord, the second growth averages 10.3 cords to the acre. At 10¢ per cord, the second growth timber would be worth \$100.00 per acre. Since about 1,000 acres is covered with an average stand of this amount, the total value of the second growth would be \$1,000, or an average for the entire 17,000 acres of \$6.06 per acre.

Because of the condition of the mature timber, and the small amount of merchantable timber, either original or second growth, the commercial value of the stand is so low, that only the soil value is taken into account.

Valuation of Land without Timber.

There has been comparatively little market for cut-over lands in the Massanutten. In some of the sales made recently, the prices were fairly high as compared with the price at which this land is held.. About eight years ago, Printz and ~~Chaffman~~ bought 325 acres of cut-over mountain land a short distance to the north for \$500.00 , or for about \$1.30 per acre. A tract of 291 acres recently sold for \$500.00 , or about \$2.50 per acre. This land was only in fair condition, and had been cut over at one time.

This tract is the largest single compact body of land in the Massanutten, and its purchase is of vital importance in establishing a National Forest in this area.

For timber production, without taking into account the present amount of cordwood, it is believed that the land has a value by types as shown in the following table:-

TABLE # 2.

Value of Land Exclusive of Timber by Types.

TYPE	Acreage	Value per Acre	Total Value
Cove	1,038	\$2.00	\$2,076.00
Slope	12,827	1.50	19,239.00
Ridge	<u>2,840</u>	.50	<u>1,420.00</u>
	16,705	Total	\$22,735.00

Average value per acre, \$1.33.

Taxation

The assessed valuation of the property is \$0.10 per acre, or approximately \$1,700 . The tax rate last year was \$12.50 per thousand. The taxes paid last year amounted to \$21.50. The total assessed value of all the land in Page County is about \$2,500,000.

S U M M A R Y.

This tract occupies a solid block, with no interior holdings, and is large enough in itself, (17,000 acres) to form a unit for management.

It is believed that enough adjoining lands can be secured at reasonable prices, to make a block of, at least, 25,000 acres, and possibly, 40,000 acres. About 3,000 acres of the Hume Survey, directly adjoining on the north, is held under option at similar prices.

It has been stripped of timber and repeatedly burned. Floods and erosions are unchecked. It is suitable only for the production of timber. In the increasingly fertile and valuable valleys on either side, the demand for timber will soon become greater than the present supply.

The entire tract is accessible and near to rail-roads.

With proper protection the Massanutten Area would become an attractive camping-ground during the summer. The land alone is estimated to be worth \$1.30, while the owners are willing to sell for \$1.25.

The immediate purchase of this tract will assist in securing other tracts at reasonable prices, in the Massanutten, the Potomac, and in the Shenandoah Areas.

For the reasons above mentioned, it is recommended that action be taken to purchase this tract during the fiscal year of 1911-12, at the price named in the option.